FIG. 1

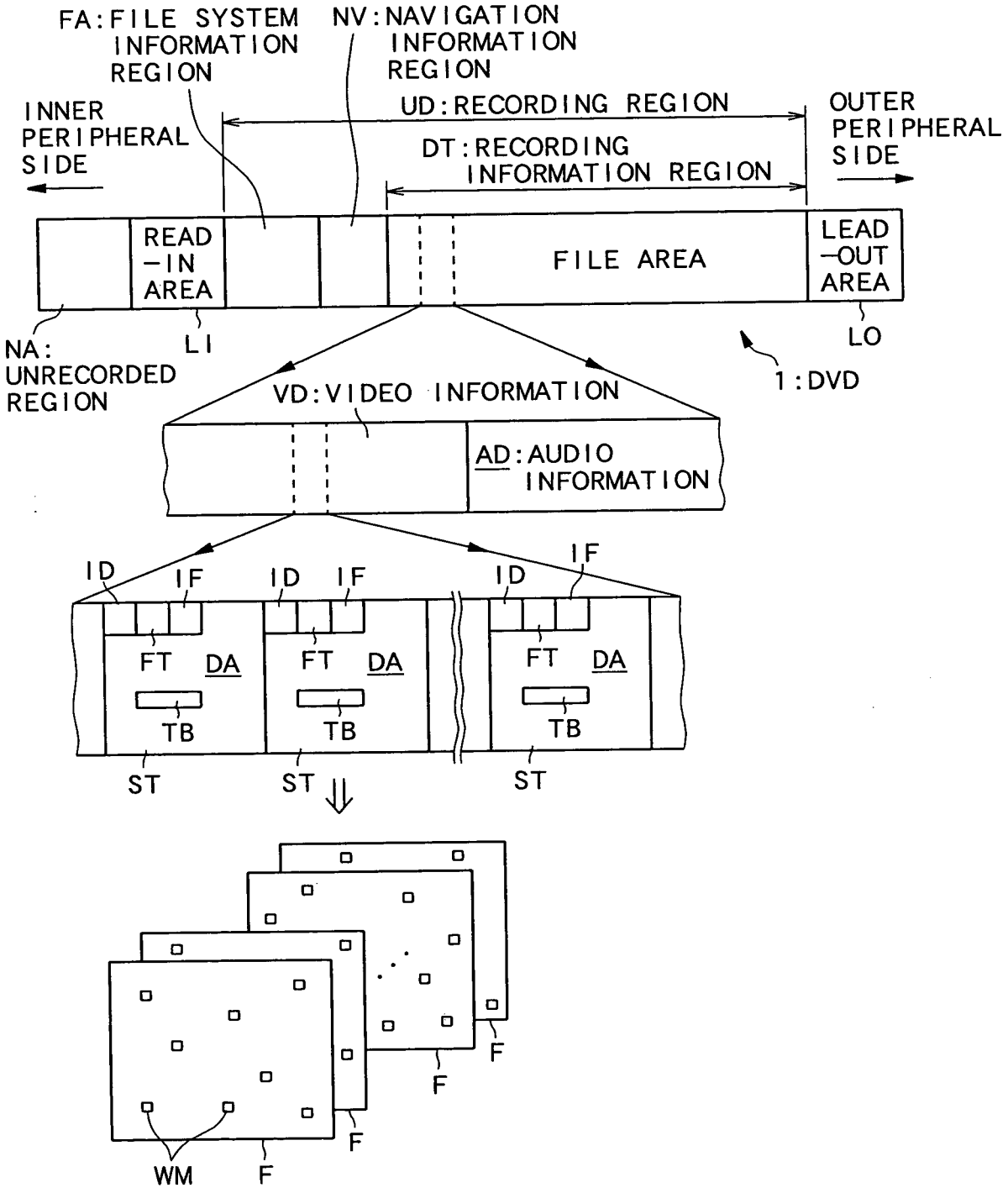
FA:FILE SYSTEM INFORMATION REGION
NV:NAVIGATION INFORMATION REGION
UD:RECORDING REGION
DT:RECORDING INFORMATION REGION
INNER PERIPHERAL SIDE
OUTER PERIPHERAL SIDE
READ-IN AREA
FILE AREA
LEAD-OUT AREA
NA: UNRECORDED REGION
LI
LO
1:DVD
VD:VIDEO INFORMATION
AD:AUDIO INFORMATION
ID
IF
FT
DA
TB
ST
F
WM

FIG. 2A

NUMBER	CONTENTS	BYTES
1	HD:HEADER INFORMATION	1
2	CCI1:FIRST COPY CONTROL INFORMATION	1
3	CCI2:SECOND COPY CONTROL INFORMATION	1
4	PA:REPRODUCIBLE REGION INFORMATION	1
5	R:AUXILIARY INFORMATION	1
6	R:AUXILIARY INFORMATION	1
7	R:AUXILIARY INFORMATION	16
8	R:AUXILIARY INFORMATION	16
9	R:AUXILIARY INFORMATION	1
10	ECC:ERROR CORRECTION INFORMATION	17

TB1

FIG. 2B

NUMBER	CONTENTS	BYTES
1	HD:HEADER INFORMATION	1
2	RP:POST-RECORDING REPRODUCIBLE REGION INFORMATION	1
3	RR:POST-RECORDING RECORDABLE REGION INFORMATION	1
4	RT:POST-RECORDING TIME-SHIFTING REGION INFORMATION	1
5	R:AUXILIARY INFORMATION	35
6	ECC:ERROR CORRECTION INFORMATION	17

TB2

FIG. 3A

BIT NUMBER	CONTENTS
1	ACCI1:FIRST REGION COPY CONTROL INFORMATION
2	
3	ACCI2:SECOND REGION COPY CONTROL INFORMATION
4	
5	ACCI3:THIRD REGION COPY CONTROL INFORMATION
6	
7	ACCI4:FOURTH REGION COPY CONTROL INFORMATION
8	

CCI1

BIT NUMBER	CONTENTS
1	ACCI5:FIFTH REGION COPY CONTROL INFORMATION
2	
3	ACCI6:SIXTH REGION COPY CONTROL INFORMATION
4	
5	ACCI7:SEVENTH REGION COPY CONTROL INFORMATION
6	
7	ACCI8:EIGHTH REGION COPY CONTROL INFORMATION
8	

CCI2

FIG. 3B

BIT NUMBER	CONTENTS
1	PA1:FIRST REGION REPRODUCIBLE REGION INFORMATION
2	PA2:SECOND REGION REPRODUCIBLE REGION INFORMATION
3	PA3:THIRD REGION REPRODUCIBLE REGION INFORMATION
4	PA4:FOURTH REGION REPRODUCIBLE REGION INFORMATION
5	PA5:FIFTH REGION REPRODUCIBLE REGION INFORMATION
6	PA6:SIXTH REGION REPRODUCIBLE REGION INFORMATION
7	PA7:SEVENTH REGION REPRODUCIBLE REGION INFORMATION
8	PA8:EIGHTH REGION REPRODUCIBLE REGION INFORMATION

PA

FIG. 4A

BIT NUMBER	CONTENTS
1	RP1 : FIRST REGION POST-RECORDING REPRODUCIBLE REGION INFORMATION
2	RP2 : SECOND REGION POST-RECORDING REPRODUCIBLE REGION INFORMATION
3	RP3 : THIRD REGION POST-RECORDING REPRODUCIBLE REGION INFORMATION
4	RP4 : FOURTH REGION POST-RECORDING REPRODUCIBLE REGION INFORMATION
5	RP5 : FIFTH REGION POST-RECORDING REPRODUCIBLE REGION INFORMATION
6	RP6 : SIXTH REGION POST-RECORDING REPRODUCIBLE REGION INFORMATION
7	RP7 : SEVENTH REGION POST-RECORDING REPRODUCIBLE REGION INFORMATION
8	RP8 : EIGHTH REGION POST-RECORDING REPRODUCIBLE REGION INFORMATION

RP

FIG. 4B

BIT NUMBER	CONTENTS
1	RR1 : FIRST REGION POST-RECORDING RECORDABLE REGION INFORMATION
2	RR2 : SECOND REGION POST-RECORDING RECORDABLE REGION INFORMATION
3	RR3 : THIRD REGION POST-RECORDING RECORDABLE REGION INFORMATION
4	RR4 : FOURTH REGION POST-RECORDING RECORDABLE REGION INFORMATION
5	RR5 : FIFTH REGION POST-RECORDING RECORDABLE REGION INFORMATION
6	RR6 : SIXTH REGION POST-RECORDING RECORDABLE REGION INFORMATION
7	RR7 : SEVENTH REGION POST-RECORDING RECORDABLE REGION INFORMATION
8	RR8 : EIGHTH REGION POST-RECORDING RECORDABLE REGION INFORMATION

RR

FIG. 4C

BIT NUMBER	CONTENTS
1	RT1 : FIRST REGION POST-RECORDING TIME-SHIFTING REGION INFORMATION
2	RT2 : SECOND REGION POST-RECORDING TIME-SHIFTING REGION INFORMATION
3	RT3 : THIRD REGION POST-RECORDING TIME-SHIFTING REGION INFORMATION
4	RT4 : FOURTH REGION POST-RECORDING TIME-SHIFTING REGION INFORMATION
5	RT5 : FIFTH REGION POST-RECORDING TIME-SHIFTING REGION INFORMATION
6	RT6 : SIXTH REGION POST-RECORDING TIME-SHIFTING REGION INFORMATION
7	RT7 : SEVENTH REGION POST-RECORDING TIME-SHIFTING REGION INFORMATION
8	RT8 : EIGHTH REGION POST-RECORDING TIME-SHIFTING REGION INFORMATION

RT

FIG. 5

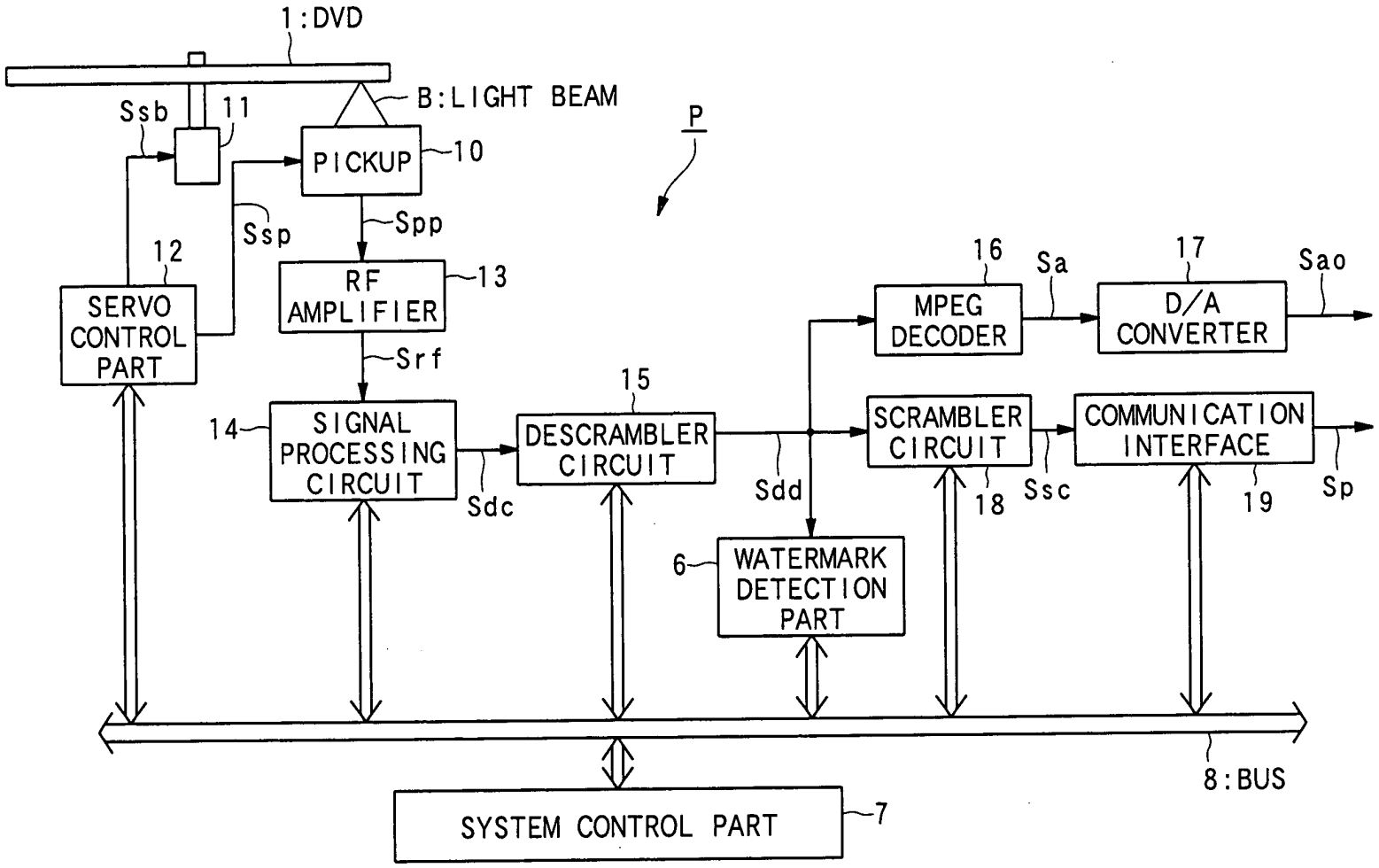
1:DVD
B:LIGHT BEAM
P
Ssb
11
PICKUP
10
Ssp
Spp
12
SERVO CONTROL PART
RF AMPLIFIER
13
Srf
16
Sa
17
Sao
MPEG DECODER
D/A CONVERTER
15
14
SIGNAL PROCESSING CIRCUIT
DESCRAMBLER CIRCUIT
Sdc
Sdd
SCRAMBLER CIRCUIT
COMMUNICATION INTERFACE
18
Ssc
19
Sp
6
WATERMARK DETECTION PART
8:BUS
SYSTEM CONTROL PART
7

FIG. 6

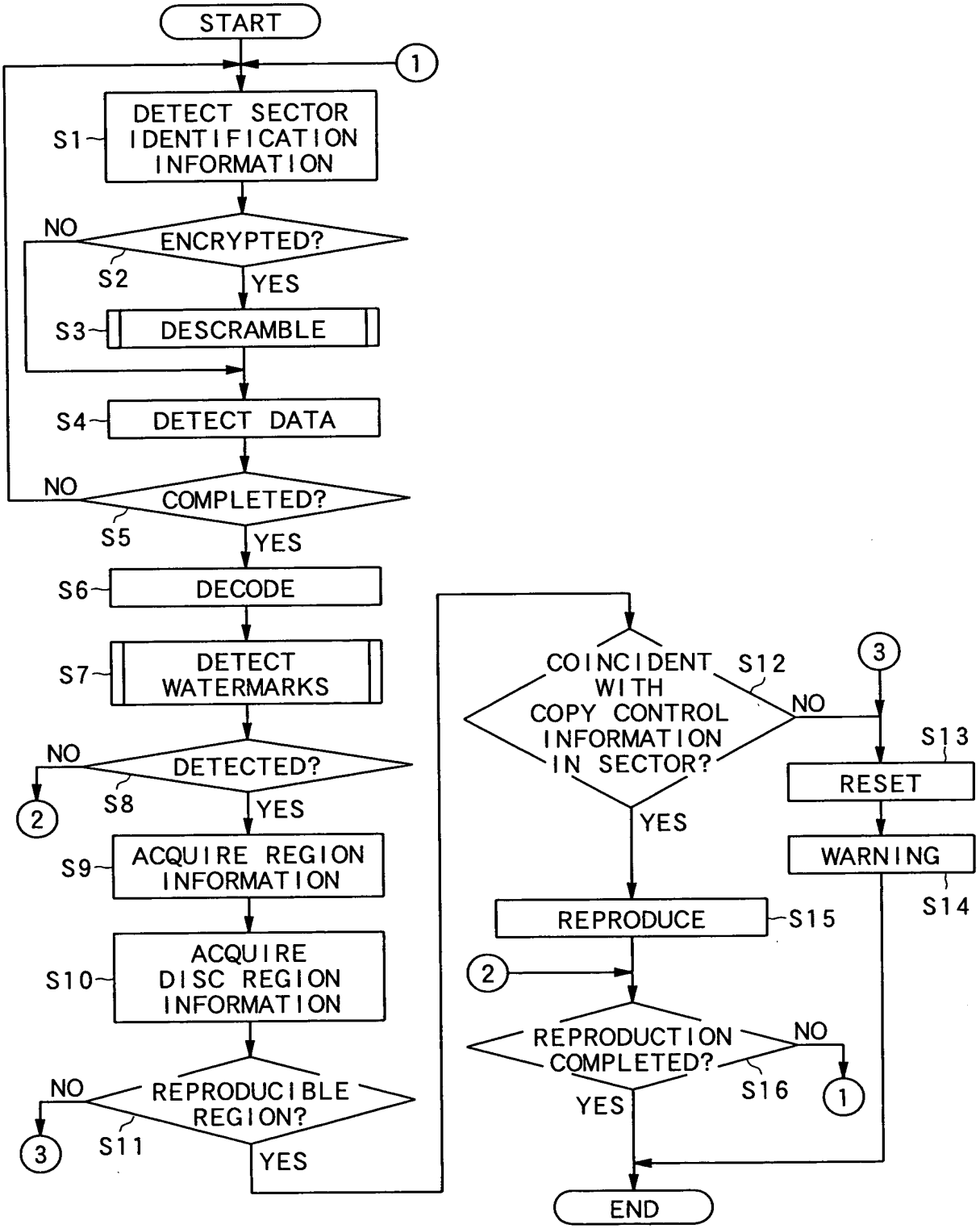
START
1
S1
DETECT SECTOR IDENTIFICATION INFORMATION
NO
ENCRYPTED?
S2
YES
S3
DESCRAMBLE
S4
DETECT DATA
NO
COMPLETED?
S5
YES
S6
DECODE
S7
DETECT WATERMARKS
NO
DETECTED?
S8
YES
2
S9
ACQUIRE REGION INFORMATION
S10
ACQUIRE DISC REGION INFORMATION
NO
REPRODUCIBLE REGION?
3
S11
YES
COINCIDENT WITH COPY CONTROL INFORMATION IN SECTOR?
S12
NO
3
S13
RESET
WARNING
S14
YES
REPRODUCE
S15
2
REPRODUCTION COMPLETED?
NO
S16
1
YES
END

FIG. 7

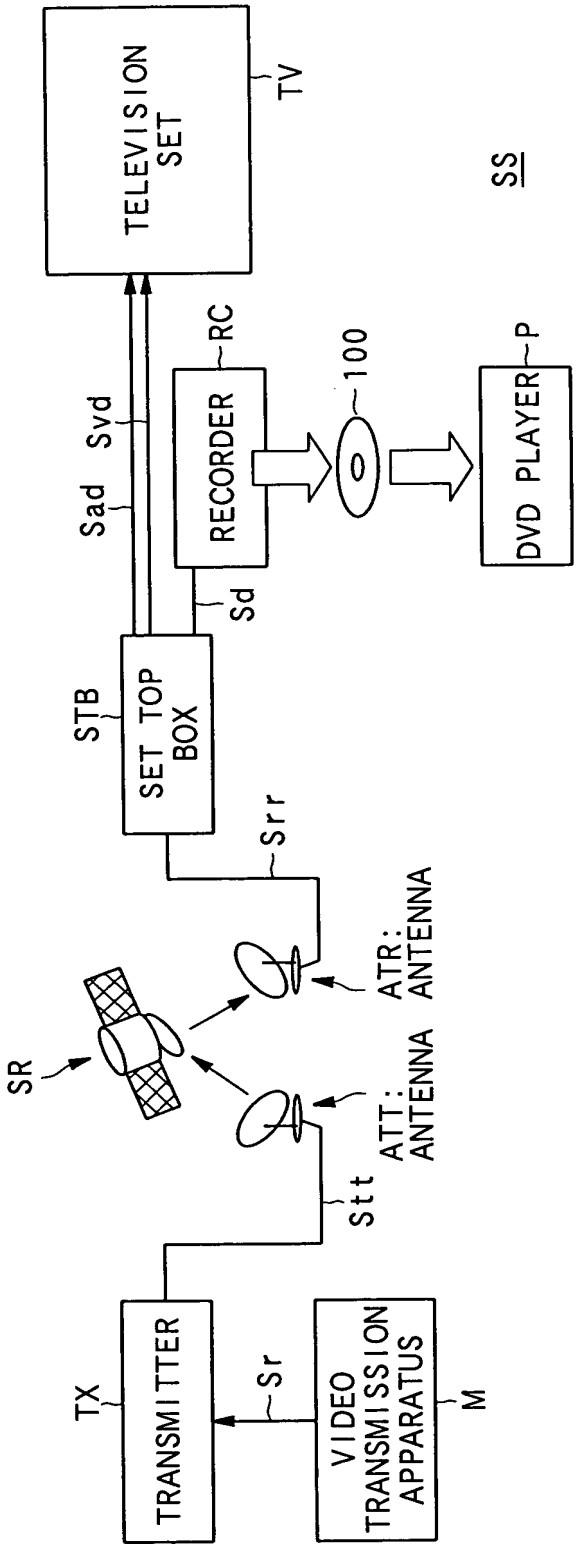
TELEVISION SET
TV
SS
RC
RECORDER
100
DVD PLAYER
P
Sad
Svd
Sd
STB
SET TOP BOX
Srr
ATR: ANTENNA
SR
ATT: ANTENNA
Stt
TX
TRANSMITTER
Sr
VIDEO TRANSMISSION APPARATUS
M

FIG. 8

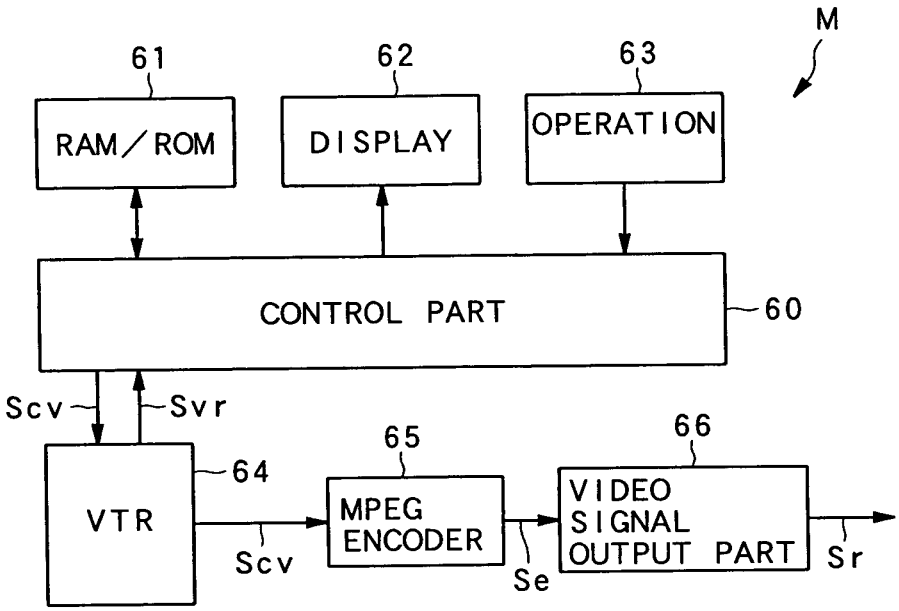
M
61
62
63
RAM/ROM
DISPLAY
OPERATION
CONTROL PART
60
Scv
Svr
64
65
66
VTR
MPEG ENCODER
VIDEO SIGNAL OUTPUT PART
Scv
Se
Sr

FIG. 9

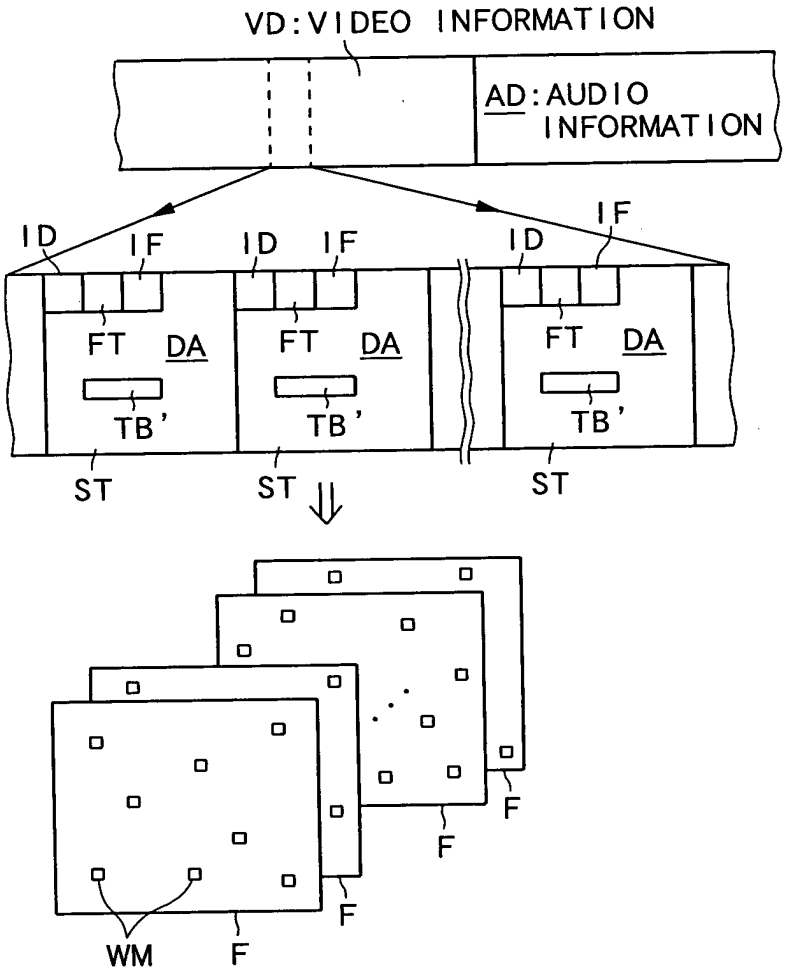
VD:VIDEO INFORMATION
AD:AUDIO INFORMATION
ID
IF
ID
IF
ID
IF
FT
DA
FT
DA
FT
DA
TB'
TB'
TB'
ST
ST
ST
F
F
F
F
WM

FIG.10A

NUMBER	CONTENTS	BYTES
1	HD:HEADER INFORMATION	1
2	CCI1:FIRST COPY CONTROL INFORMATION	1
3	CCI2:SECOND COPY CONTROL INFORMATION	1
4	PA:REPRODUCIBLE REGION INFORMATION	1
5	RAA:RECORDABLE REGION INFORMATION	1
6	TA:TIME-SHIFTING REGION INFORMATION	1
7	PT:VIEWABLE PERIOD INFORMATION	16
8	RT:RECORDABLE PERIOD INFORMATION	16
9	TT:TIME-SHIFTING PERIOD INFORMATION	1
10	ECC:ERROR CORRECTION INFORMATION	17

TB1'

FIG.10B

NUMBER	CONTENTS	BYTES
1	HD:HEADER INFORMATION	1
2	CCI1:FIRST COPY CONTROL INFORMATION	1
3	CCI2:SECOND COPY CONTROL INFORMATION	1
4	PA:REPRODUCIBLE REGION INFORMATION	1
5	RAA:RECORDABLE REGION INFORMATION	1
6	RA:RECORDING REGION INFORMATION	1
7	PT:VIEWABLE PERIOD INFORMATION	16
8	RT:RECORDABLE PERIOD INFORMATION	16
9	TT:TIME-SHIFTING PERIOD INFORMATION	1
10	ECC:ERROR CORRECTION INFORMATION	17

TB1"

FIG.11A

BIT NUMBER	CONTENTS
1	RAA1: FIRST REGION RECORDABLE REGION INFORMATION
2	RAA2: SECOND REGION RECORDABLE REGION INFORMATION
3	RAA3: THIRD REGION RECORDABLE REGION INFORMATION
4	RAA4: FOURTH REGION RECORDABLE REGION INFORMATION
5	RAA5: FIFTH REGION RECORDABLE REGION INFORMATION
6	RAA6: SIXTH REGION RECORDABLE REGION INFORMATION
7	RAA7: SEVENTH REGION RECORDABLE REGION INFORMATION
8	RAA8: EIGHTH REGION RECORDABLE REGION INFORMATION

RAA

FIG.11B

BIT NUMBER	CONTENTS
1	TA1 : FIRST REGION TIME-SHIFTING REGION INFORMATION
2	TA2 : SECOND REGION TIME-SHIFTING REGION INFORMATION
3	TA3 : THIRD REGION TIME-SHIFTING REGION INFORMATION
4	TA4 : FOURTH REGION TIME-SHIFTING REGION INFORMATION
5	TA5 : FIFTH REGION TIME-SHIFTING REGION INFORMATION
6	TA6 : SIXTH REGION TIME-SHIFTING REGION INFORMATION
7	TA7 : SEVENTH REGION TIME-SHIFTING REGION INFORMATION
8	TA8 : EIGHTH REGION TIME-SHIFTING REGION INFORMATION

TA

FIG.12A

NUMBER	CONTENTS	BYTES
1	PT1 : FIRST REGION VIEWABLE PERIOD INFORMATION	2
2	PT2 : SECOND REGION VIEWABLE PERIOD INFORMATION	2
3	PT3 : THIRD REGION VIEWABLE PERIOD INFORMATION	2
4	PT4 : FOURTH REGION VIEWABLE PERIOD INFORMATION	2
5	PT5 : FIFTH REGION VIEWABLE PERIOD INFORMATION	2
6	PT6 : SIXTH REGION VIEWABLE PERIOD INFORMATION	2
7	PT7 : SEVENTH REGION VIEWABLE PERIOD INFORMATION	2
8	PT8 : EIGHTH REGION VIEWABLE PERIOD INFORMATION	2

PT

FIG.12B

NUMBER	CONTENTS	BYTES
1	RT1 : FIRST REGION RECORDABLE PERIOD INFORMATION	2
2	RT2 : SECOND REGION RECORDABLE PERIOD INFORMATION	2
3	RT3 : THIRD REGION RECORDABLE PERIOD INFORMATION	2
4	RT4 : FOURTH REGION RECORDABLE PERIOD INFORMATION	2
5	RT5 : FIFTH REGION RECORDABLE PERIOD INFORMATION	2
6	RT6 : SIXTH REGION RECORDABLE PERIOD INFORMATION	2
7	RT7 : SEVENTH REGION RECORDABLE PERIOD INFORMATION	2
8	RT8 : EIGHTH REGION RECORDABLE PERIOD INFORMATION	2

RT

FIG.12C

BIT NUMBER	CONTENTS
1	RA1: FIRST REGION RECORDING REGION INFORMATION
2	RA2: SECOND REGION RECORDING REGION INFORMATION
3	RA3: THIRD REGION RECORDING REGION INFORMATION
4	RA4: FOURTH REGION RECORDING REGION INFORMATION
5	RA5: FIFTH REGION RECORDING REGION INFORMATION
6	RA6: SIXTH REGION RECORDING REGION INFORMATION
7	RA7: SEVENTH REGION RECORDING REGION INFORMATION
8	RA8: EIGHTH REGION RECORDING REGION INFORMATION

RA

FIG.13

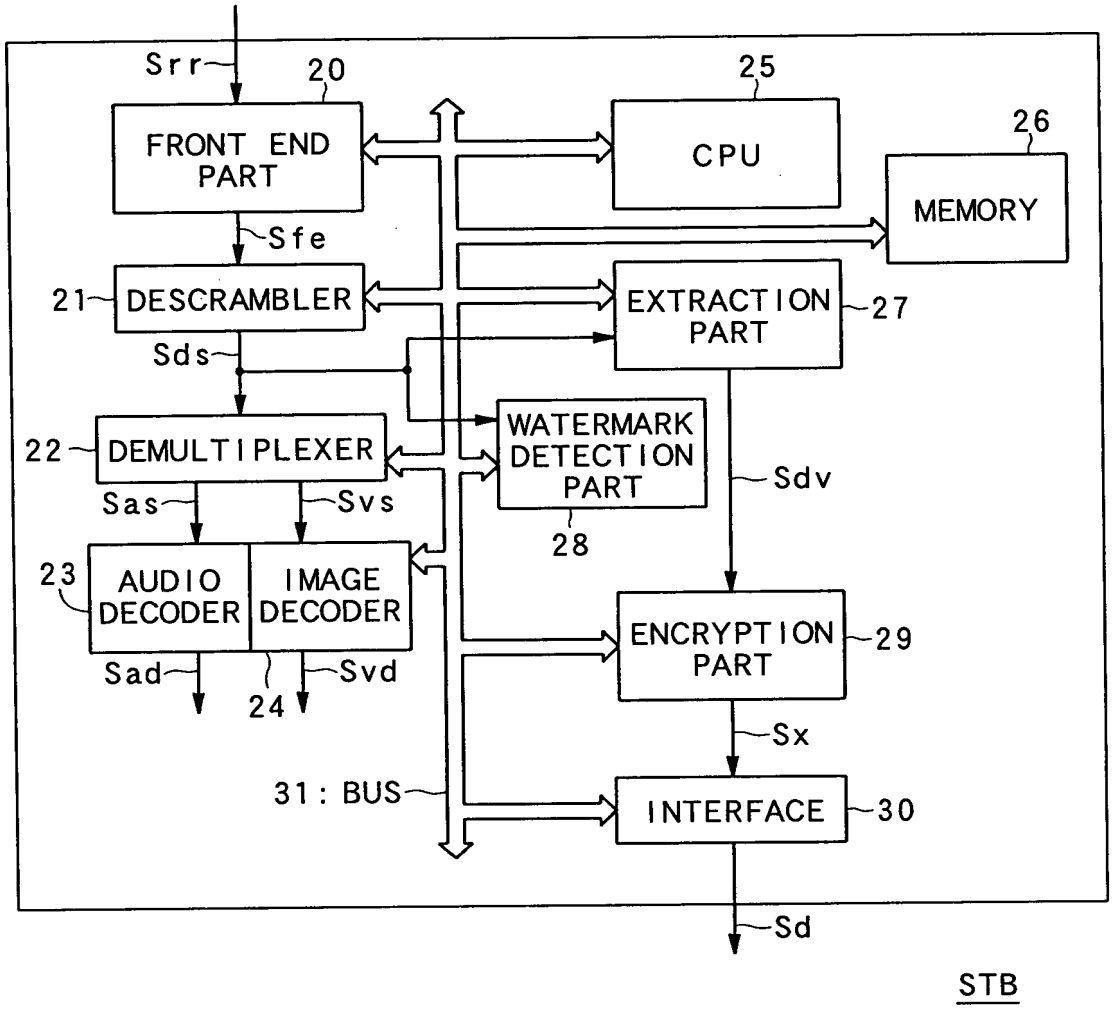
Srr
20
FRONT END PART
Sfe
21
DESCRAMBLER
Sds
22
DEMULTIPLEXER
Sas
Svs
23
AUDIO DECODER
IMAGE DECODER
Sad
24
Svd
31 : BUS
25
CPU
26
MEMORY
EXTRACTION PART
27
WATERMARK DETECTION PART
28
Sdv
ENCRYPTION PART
29
Sx
INTERFACE
30
Sd
STB

FIG.14

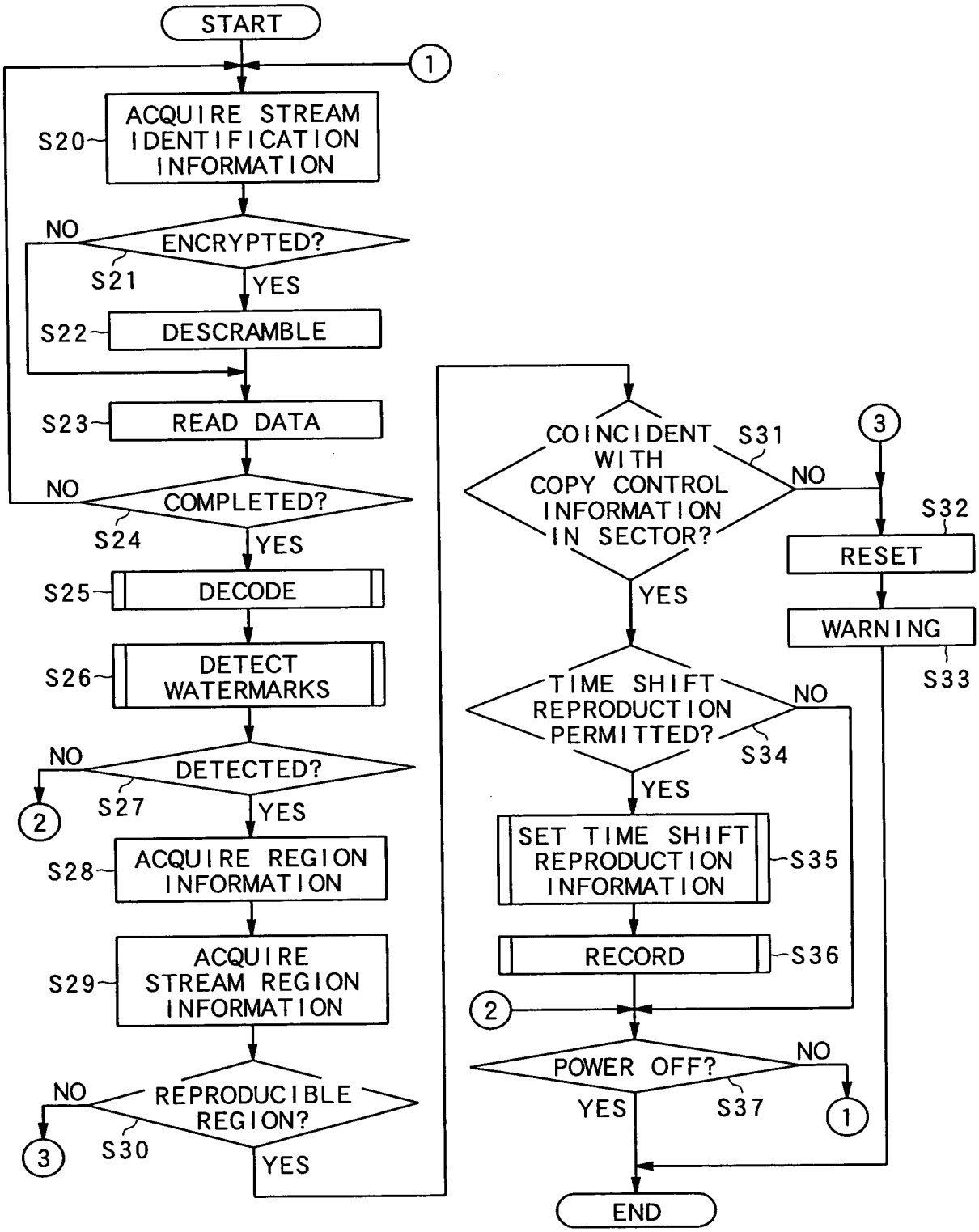
START
1
S20
ACQUIRE STREAM IDENTIFICATION INFORMATION
NO
ENCRYPTED?
S21
YES
S22
DESCRAMBLE
S23
READ DATA
NO
COMPLETED?
S24
YES
S25
DECODE
S26
DETECT WATERMARKS
NO
DETECTED?
S27
YES
2
S28
ACQUIRE REGION INFORMATION
S29
ACQUIRE STREAM REGION INFORMATION
NO
REPRODUCIBLE REGION?
S30
YES
3
COINCIDENT WITH COPY CONTROL INFORMATION IN SECTOR?
S31
NO
YES
3
S32
RESET
WARNING
S33
TIME SHIFT REPRODUCTION PERMITTED?
S34
NO
YES
SET TIME SHIFT REPRODUCTION INFORMATION
S35
RECORD
S36
2
POWER OFF?
S37
NO
YES
1
END

FIG.15

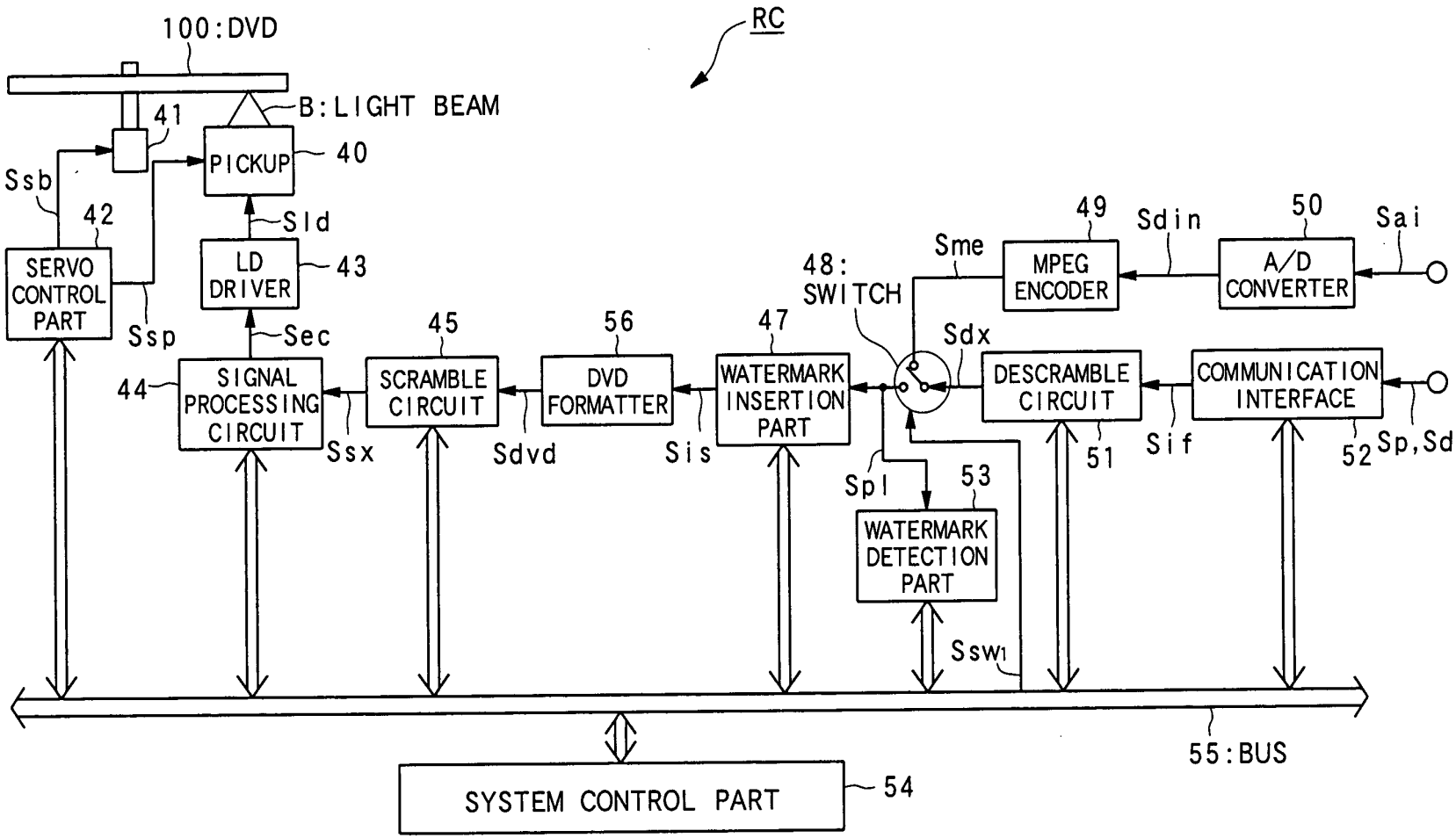
100:DVD
RC
B:LIGHT BEAM
41
PICKUP
40
Ssb
42
SERVO CONTROL PART
Ssp
Sld
LD DRIVER
43
Sec
44
SIGNAL PROCESSING CIRCUIT
Ssx
45
SCRAMBLE CIRCUIT
Sdvd
56
DVD FORMATTER
Sis
47
WATERMARK INSERTION PART
48: SWITCH
Spl
53
WATERMARK DETECTION PART
Sswi
Sme
49
MPEG ENCODER
Sdin
50
A/D CONVERTER
Sai
Sdx
DESCRAMBLE CIRCUIT
51
Sif
COMMUNICATION INTERFACE
52
Sp,Sd
55:BUS
SYSTEM CONTROL PART
54

FIG.16

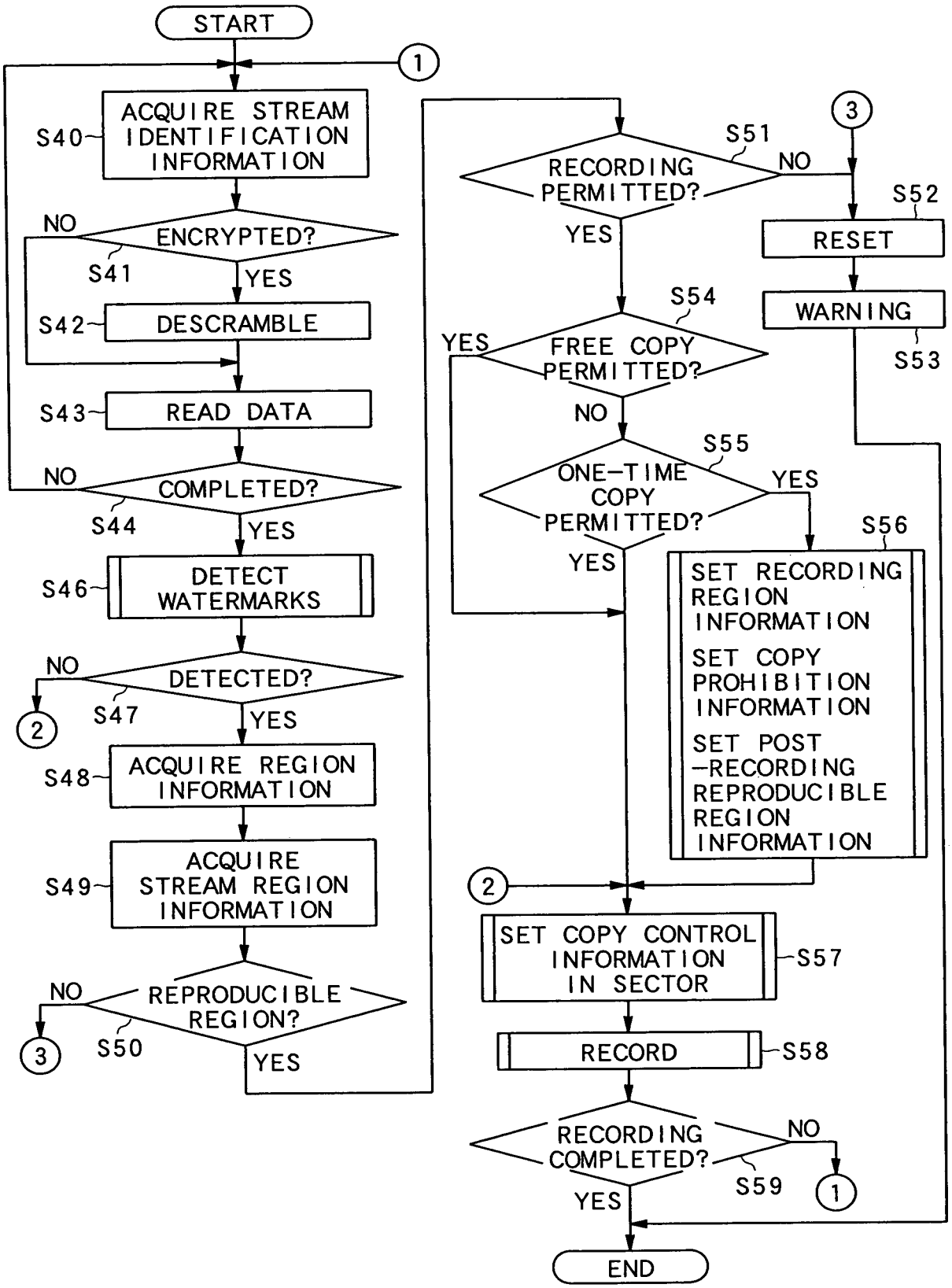
START
1
S40
ACQUIRE STREAM IDENTIFICATION INFORMATION
NO
ENCRYPTED?
S41
YES
S42
DESCRAMBLE
S43
READ DATA
NO
COMPLETED?
S44
YES
S46
DETECT WATERMARKS
NO
DETECTED?
S47
YES
2
S48
ACQUIRE REGION INFORMATION
S49
ACQUIRE STREAM REGION INFORMATION
NO
REPRODUCIBLE REGION?
3
S50
YES
S51
RECORDING PERMITTED?
NO
YES
3
S52
RESET
WARNING
S53
S54
YES
FREE COPY PERMITTED?
NO
S55
ONE-TIME COPY PERMITTED?
YES
YES
S56
SET RECORDING REGION INFORMATION
SET COPY PROHIBITION INFORMATION
SET POST-RECORDING REPRODUCIBLE REGION INFORMATION
2
SET COPY CONTROL INFORMATION IN SECTOR
S57
RECORD
S58
RECORDING COMPLETED?
NO
S59
1
YES
END

FIG.17A

NUMBER	CONTENTS	BYTES
1	HD:HEADER INFORMATION	1
2	CCI1:FIRST COPY CONTROL INFORMATION	1
3	CCI2:SECOND COPY CONTROL INFORMATION	1
4	H1:FIRST HASH VALUE	1
5	ECC:ERROR CORRECTION INFORMATION	4

TB1"a

FIG.17B

NUMBER	CONTENTS	BYTES
1	HD:HEADER INFORMATION	1
2	H2:SECOND HASH VALUE	1
3	R:AUXILIARY INFORMATION	1
4	PA:REPRODUCIBLE REGION INFORMATION	1
5	RAA:RECORDABLE REGION INFORMATION	1
6	RA:RECORDING REGION INFORMATION	1
7	PT:VIEWABLE PERIOD INFORMATION	16
8	RT:RECORDABLE PERIOD INFORMATION	16
9	TT:TIME-SHIFTING PERIOD INFORMATION	1
10	ECC:ERROR CORRECTION INFORMATION	17

TB1"b